
POPULAR
Computing
WEEKLY
30p
Robot Control on ZX81
ZX81 speech pack
Basic re-numbering
Win a ZX Spectrum & ZX Printer - details inside

POPULAR
Computing
WEEKLY

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All submissions should be typed and a double space should be left between each line.

Programs should, whenever possible, be computer printed.

At present we cannot guarantee to return every submitted article, so please keep a copy.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

This Week


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Editorial

The phenomenal growth in the number of home microcomputers over the past two years has given rise to a similar growth in the number of different computer languages.

The ZX81, Vic20, Spectrum, BBC micro and TRS80 all have their own versions of Basic — the most commonly used microcomputer language. Unfortunately most of these variations of Basic are mutually exclusive. A program written for a Vic20 will not run on a ZX81 or a BBC micro.

It is usually possible to convert programs from one version of Basic to another but it is time consuming and a waste of effort that could better be put to writing original programs.

However the chances of a standard version of Basic being voluntarily adopted throughout the industry are so remote as to be hardly worthy of consideration. No manufacturer is going to promote another company's products at his own expense.

The solution to this problem lies in the hands of the users. An organised users lobby could put pressure on the manufacturers to agree to a common form of Basic. They will not do it on their own.

Next Week



You're lost in time with a rogue space brigade hot on your vapour trail! Have you got the skill to be a Time Traveller?

Classified

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[illegible]

[illegible]

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[illegible]

HEARING IS BELIEVING

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TELESOUND 82 [illegible] the Telesound 82 [illegible] games [illegible]

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[illegible]

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ZX81 16K RAM [illegible]

VIC-20 CITY BOMBER, [illegible] Waltham, Herts.

ATOM, fully expanded, FP ROM, [illegible]

ZX81 SYSTEM plus 16K RAM-Pack Keyboard and [illegible] £100 Evenings [illegible]

ZX PRINTER. [illegible] Tel. Leeds [illegible] (after 6 pm)

NEW FULLER [illegible] ZX81 keyboard [illegible]

ZX81 16K (Sinclair) [illegible] £75 [illegible]

B.B.C. MODEL A, [illegible] Telephone [illegible]

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VIC 20, [illegible] J. Mann [illegible]

[illegible]

PERSONAL TUITION [illegible] B.B.C. [illegible] Telephone [illegible]

ZX81 16K, [illegible] large keyboard [illegible] £100 Telephone [illegible]

ZX81 16K, keyboard-case [illegible]

VIC 20, plus [illegible]

SHARP PC1211 pocket computer with cassette interface £80 Telephone [illegible] (evenings)

ZX81 16K, [illegible] Telephone [illegible]

ZX81 1K, [illegible] (evenings)

VIC-20, cassette unit, over £20 software and [illegible] worth £270 [illegible]

VIC Users. Add to your software by exchange. Write for list to [illegible]

BBC GAMES, [illegible]

ZX81 16K + SOFTWARE. Value over [illegible] £100 [illegible] Tel. [illegible]

VIC MICRO GAMES. Cassette A [illegible] Cassette B [illegible] Both cassettes for £9 [illegible]

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ICL strike ends hopes of early Micro B delivery

The gremlins which have so far pushed deliveries of the BBC Micro B back by six months have struck again with a strike at ICL, the main supplier.

The production stoppage at ICL's Kidsgrove plant has brought all deliveries of the B machine to a halt.

Acorn's John Coll admits that ICL's production at 200 units per week was already 500 per week below target. Now the company is taking strenuous steps to inspire confidence in its ability to supply the B machine.

Two other manufacturers apart from ICL will shortly begin production of the model B. They are AB Electronic Systems — formerly Cleartune — who begin production immediately, and Race Electronics of Llantrisant, who commence production in the middle of this month.

With three companies producing the B machine, Acorn expects to quickly reduce its six month backlog. Meanwhile John Coll told *PCW*: "I am saddened and frustrated by the whole ICL situation. The position is acutely embarrassing. We thought we would be at the four week order turn [illegible]."

Although [illegible] cheques are [illegible] card [illegible] have been drawn [illegible] still lodge standing orders for which cheques have been cashed.

John Coll explained that Acorn will give a refund to customers who replace their cashed-cheque orders with a credit-card order. This offer will not prejudice the purchaser's position in the queue of orders. The credit card account will then not be drawn until the micro is dispatched.

Deliveries of the model A have been unaffected by production [illegible].

Spectrum get to the customer

Delivery of the first production run Spectrums has now taken place.

The batch forms part of the delivery of machines returned to Timex for further work. This followed the discovery of a design flaw, reported in *Popular Computing Weekly* June 17.

To correct the reported data bus clash, each of the micros dispatched has been modified by hand.

Pins 36 and 37 of the ULA chip have been cut away from the printed-circuit board and a NAND gate inserted between the ULA and the board. This means that Pins 36 and 37 are inhibited when the input-output request lines from the microprocessor are operating.

This gives priority to the CPU over the ULA when both are trying to use the same data.

The design modification has now been incorporated into the production line at Timex and at the time of going to press the second batch had left the factory.

Next to [illegible] the Amber [illegible]

Amber unveils low-cost matrix printer

A new dot matrix printer is to be manufactured by Amber Controls Ltd.

To be priced at just under £70 the Amber 2400 printer is intended for use with BBC, Vic20 or Tangerine micros. A version for the ZX81 will also be produced.

The text print width is 24 characters. The machine was designed for use with ordinary paper to reduce running costs.

The Amber 2400 [illegible] the [illegible] It uses four print solenoids which each cover one quarter of the paper width. The paper is incremented [illegible] dot height during the return scan of the print heads.

The printer is supplied with its own built-in operating system and power supply.

Available from the end of August the Amber 2400 will be priced at £69.95 plus VAT. Five 90ft rolls of paper and one inked ribbon will cost about £3.50.

For further details contact Amber Controls Ltd, Central Way, Walworth Industrial Estate, Andover, Hants.

Japanese link-up for IBM

IBM is currently negotiating with Japanese firm Matsushita Electric Industrial to develop joint business ties.

One possible venture may involve the [illegible] general and distribution of a new personal computer.

Matsushita already supplies IBM components.



Ground Control's [illegible] board

Latest I/O port for ZX81

A new combined 16k Ram and I/O board for the ZX81 has been launched by Ground Control.

The board plugs into the expansion connector at the rear of the ZX81.

The I/O interface, memory mapped and uses the [illegible] PP10 chip. The I/O has [illegible] 14-pin DIL sockets.

The module is available with power supply [illegible] complete for £57 or in kit form for £40.75.

Information from Ground Control, Alfreda Avenue, Hullbridge, Essex.

Software debut for the ZX82

[illegible]

Bug Byte [illegible] launched *Spectral* [illegible] the first [illegible] Spectrum.

[illegible] Software, [illegible] Birmingham.

Spectral [illegible] from Bug Byte Software, Freepost, [illegible] L3 4AB.

Spectrum tapes Microfest '82

In [illegible] computers in *Popular Computing Weekly* June 24 we mistakenly stated that the Spectrum cassette system [illegible] work.

The ZX Spectrum [illegible] saves and verifies [illegible] 1500 baud. We have had no problems with the [illegible]

Letters



Let's put the record straight

Re your Spectrum Review (May 6). I would like to point out that the maximum number of colours we can put on the screen on the BBC Micro at any one time is not four but eight. Here is the program

```
10 C=0
20 MODE 7
30 FOR B=129 TO 134
40 C=C+1
50 VDU A
60 PRINT "COLOUR" C
70 N.A
```

In the now famous ZX Spectrum catalogue Sinclair have a table. In the table they say the BBC Micro has no user definable graphics. Well if the VDU 23 allows this. Have a look at Neil and Pat Cryer's book *Basic Programming on the BBC Microcomputer*.

Sinclair also say the BBC Micro has no VERIFY command. It has — *CAT will not only catalogue it will also show SAVE errors.

Sinclair do not point out that the BBC Micro has 320×256 hi-res graphics. Nor do they mention that the BBC Micro has 42 different plot commands. The only thing the BBC does not have that the Spectrum does have is 'BRIGHT'. I am sure that it is better to have a highly expandable system, with the most powerful Basic and the highest res graphics for under £400 than a ZX Spectrum which can only play one note at a time compared with the BBC's four.

Robert Lubin
Rivendell
11 Pall y mo Crescent
Cardiff CF5 5LR

A Narrowing view of PCW

Popular Computing Weekly has made a good slog start and I hope you can maintain the momentum. It is an unfortunate fact that 90 percent of program listings contain substituted and/or typographical errors in all magazines (at present I am buying eight monthly magazines and your weekly magazine).

Not having had time to enter and run any of the programs in *Popular Computing Weekly* (issues 1–5) I am not in a position to comment on the percentage of errors contained within them. However in issue 4 Barry Cornhill's feature in Chaining ZX81 programs together omits the six mentioned programs altogether. Any chance of printing them in a future issue?

Lastly please scrap Cameo Pop — it is a total time-consuming contest issue. It would be better to leave that section of the page blank for competitors doodlings etc. The thought of Messrs Ireland and Macdonald being paid for that drivel makes my eyes water.

G O Breen
105 Roxborough Road
Harrow HA1 1NT

Playing the RAND game

A tip for people with ZX81s and Tom Baker's code book — enter RAND 450 before running Life. You will be in for a surprise to say the least.

Other interesting RANDs are 440, 480 and 510. Any offers for more or they definitely exist?

Paul F Toomb
16 Thirlmere Road
Dewsbury
West Yorkshire WF12 7ED

GOTO this VAL function

In the first issue of *Popular Computing Weekly* (I abbreviate it PCW) Graham Charlton devised a method of converting the ON ... GOTO facility for use in ZX81 programs using the AND logical connective.

The method I use may be of interest to readers. It has the advantage that it does not involve re-numbering as GOTO 100*J may and it also looks more like the conventional ON ... GOTO. Simply use the VAL function along with the string slicing properties of ZX basic. For example, to translate

```
ON J GOTO 1200,2400 1000,25
```

for the ZX write

```
GOTO VAL "120024001000025" (4*J-3 TO 4*J)
```

Clearly if the line numbers were no more than three characters long then the term in brackets could be written (3*J−2 TO 3*J).

Alexander Macphee
26 Cleuburn Gardens
Whitburn
West Lothian EH47 0NL

Manpower helps the ZX printer

Roger Betley may find that the answer to his problem of faint printing on the ZX81 (Peek & Poke, April 23) is to pull the paper gently as it feeds through. The ZX81 printer is like a car with a flat battery — so much current is taken by the motor that there is nothing left for the spark. Easing the load on the motor in this way may give a darker print.

Tim Goldingham
11 Furze Platt Road
Maidenhead SL6 7ND

Please look Sharp about it!

Congratulations on an excellent magazine. I have found only one thing wrong with it — I have recently outgrown my ZX81 and expanded to a Sharp MZ80K. Please, please, please could you cater for the MZ80K as well as the ZX81, Vic and BBC Micro. I am looking forward to the next issue of *Popular Computing Weekly* and hope you feature the MZ80K.

Nigel Nock
Cwmfort House
Bowls Lane
Caerphilly
Glamorgan
South Wales CF8 7TW

Catering for the top brass . . .

In reply to your Sound and Vision article in your May 27 issue please find enclosed a routine for producing a brass envelope on a Vic-20.

This should work on any music producing micro. You would only need to alter the volume address V' (36878 on the Vic) and the limits of this (0 to 15) on the Vic). You may also like to amend the quantities in the delay (FOR NEXT) loops to take into account the different running speeds of micros.

Once you have set up a series of pitch pokes to make your tone in the normal fashion — you only need to enter GOSUB 1000 after each poke.

The volume starts and drops back to one. This is to eliminate the annoying click which is heard when the volume V is poked on and off. The volume should be poked off at the end of the tune to avoid a constant drone in the rest of the program.

Of course this is not a true brass synthesis, as there is neither sawtooth wave nor envelope filter but it gives more realism than the drainpipe on off sound with which micros seem to be lumbered.

Although I would not play my Vic during a live performance I do use it to produce a repeating melody and a display on a monitor prior to our band's entrance on stage at gigs.

```
   1 V=36878
1000 REM BRASS ENVELOPE
1002 REM (A)DSR
1004 FOR A=1 TO 15
1006 POKE V,A
1008 FOR T=1 TO 2
1010 NEXT T,A
1100 REM A(D)SR
1102 FOR D=15 TO 4 STEP -1
1104 POKE V,D
1106 NEXT D
1200 REM AD(S)R
1202 FOR S=1 TO 36
1204 NEXT S
1300 REM ADS(R)
1302 FOR R=4 TO 1 STEP -1
1304 POKE V,R
1306 FOR T=1 TO 8
1308 NEXT T,R
1310 RETURN
```

D Whitaker
204 Poplar Court
Salford 6

If you have an opinion you want to express or have spotted an error that needs correcting, write to Letters, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2



You are living in a world dominated by robots. All the work is done by robots while humans follow a hedonistic lifestyle devoted to idle pleasure.

In a society similar to ancient Rome life has lost its meaning and its value. Pleasure has become the ultimate goal and bloodlust the ultimate pleasure.

To satisfy this growing desire for blood a world wide lottery has been instituted. Everybody's name is fed into the central computer. You are one of the unlucky few who has been chosen to compete in *The Games*.

A miniature radio transmitter has been surgically implanted in your body and you have been released in an arena. A robot, attuned to the transmitter in your body is pursuing you relentlessly. The only way you can escape is by forcing the robot to step onto a mine. If you position yourself so the mine lies in the robot's path it will step onto it and be destroyed.

But your respite will be brief. If you succeed in avoiding the first robot two more will be released in the arena. If you manage to avoid these two robots three more will take their place and so on.

Machine code

This program runs on a 16K ZX81 and makes judicious use of machine code. But the program must be entered exactly as shown in the listing to ensure that the correct addresses are used. Particular attention should be paid to lines 100-137 as they contain the hex code for the machine code. Line 1 should consist of exactly 480 dots.

After entering the program you should save it onto tape immediately. This will save you from typing in the entire program again if the computer should crash.

When the program is run the screen will go blank for a few seconds while the machine code is poked into line 1. If you have made any mistakes in entering the hex code the following message will appear on the screen: PARITY ERROR AT LINE N. You should then correct any mistakes on that line before attempting to run the program again.

If you have entered the program correctly the arena will appear on the screen. You will be represented by an H in the top left-hand corner. A robot will appear in the form of an inverse quotation mark and a mine will appear as a grey square.

To move the H around the screen, use the keys in a square around the S key:

```
Q   W   E
  ↖ ↑ ↗
A ←   → D
  ↙ ↓ ↘
Z   X   C
```





A 16K game for the ZX81
by Simon Lane

```
1 REM
[illegible]
40 RETURN
100 REM [illegible]
[illegible]
190 IF PEEK [illegible] THEN GOTO
1000
[illegible]
210 LET [illegible]
[illegible]
```

```
240 IF P=16830 THEN LET [illegible]
[illegible]
600 PRINT "PARITY ERROR [illegible]
610 STOP
1000 LET [illegible]
[illegible]
1060 NEXT [illegible]
1070 PRINT [illegible]
[illegible]
1140 IF [illegible] THEN PRINT [illegible]
[illegible]
2100 GOTO 1010
5000 LET [illegible]
[illegible]
5030 RETURN
```

READ-OUT

READ-OUT FOR SOFTWARE & BOOKS

POPULAR COMPUTING WEEKLY/READ-OUT BOOK SERVICE

For the BBC Micro

If you own a BBC Micro the *Practical Programs for the BBC Computer* by David Johnson Davies is the book for you! It contains over twenty practical programs ranging from maths and graphics to language manipulation and games. The programs have been tested and they work!

Now that Auntie Beeb is actually delivering its micros to customers *BASIC Programming on the BBC Microcomputer* by Neil and Pat Cryer will provide an excellent introduction on how to program in BASIC specifically for the BBC Micro. Every program has been tested on a production model.

For the ZX81

Byteing Deeper into Your ZX81 by Mark Harnean is the bestseller which tells you how to get to grips with your ZX81 and with 35 programs to match!

The ZX81 Pocket Book by Trevor Toms covers the use of the ZX81 in detail and leads the reader into a clear understanding of programming.

20 Simple Electronic Projects for the ZX81 by Stephen Adams can really put your ZX81 to practical use in a number of electronic projects — thermometer, burglar alarm, voltmeter etc.

34 Amazing Games for the ZX81 by Alastair Gourlay shows you what you can do with only 1K of memory.

For the PET

An excellent introduction for beginners and an invaluable aid for enthusiasts is *The Personal Computer Book* 2nd Edition by Robin Bradbeer which tells you all you need to know about microcomputers.

"... sets out in a very entertaining and readable form the facts on owning a computer ..." *Computing Today*

"Robin Bradbeer's book provides all the information in one place in a sensible order and in a consistent clear style." *Practical Computing*

For the Beginner

Learning to Use the PET Computer by Garry Marshall is the first in a series of books that introduces popular micros (others to follow are ZX81, ZX Spectrum, VIC 20 and BBC Microcomputer). It eases the reader into a clear understanding of his computer.

Programming the PET CBM by Raeto West is quite simply the best book on the PET ever published. It contains everything you'll ever need to know about the PET and its workings.







Why ham and chips means new wave radio

David Kelly talks to Paul Newman, founder of the Sinclair Amateur Radio User Group

Paul Newman's house in Leiston is distinguished from its neighbours by the 24-feet 16-element antenna which extends upwards into the sky from his chimney.

During the day he is a computer programmer for a software house, but by night he is to be found at his 'old pump handle'.

He is an amateur radio ham, call sign G4INF.

In 1981 he formed SARUG, the Sinclair Amateur Radio User Group, which now has upwards of 175 members.

How did he become involved with amateur radio in the first place? Paul explains: "I was about 10 years old. Wandering round the estate where I lived, I saw this guy with funny bits of wire in his garden. I asked him what they were — he explained — and I've been fascinated ever since."

With the advent of the ZX80 he became seriously interested in the possible applications of microcomputers for amateur radio users.

The most obvious such use of a micro is for the encoding and decoding of radio messages. Nearly all amateur radio enthusiasts use either Morse code or radio teletype for transmission. Very little speech is sent or received, mainly because amateur radio messages are sent all over the world. Where a voice would be unintelligible, a sequence of short and long sound pulses can still be distinguished.

Both Morse and radio teletype lend themselves to automatic microcomputer control.

Paul first contacted a like-minded radio user on air — Steve Gibbs, who broadcasts from Guernsey. They corresponded for some time and then placed an advertisement, asking to hear from other radio micro users, in the American magazine 73. Seventy Three is ham radio slang for 'greetings'.

As a result of the advertisement, Paul heard from Marty Irons, who runs the American Sinclair Amateur Radio User Group (ASARUG). Paul joined ASARUG, becoming the first British member. But he also began to think of forming a similar UK group.

Computer radio hero Paul Newman

Early in 1981 he wrote to *Radio Communication* asking for interested micro users to contact him. "I thought we could exchange ideas, programs and generally keep each other in touch," he says. "I thought I might get about 20 to 30 replies.

"Had I known what I know now I might have thought twice about doing it."

In the following two weeks Paul received over 200 replies. The response caused him unexpected problems. "It soon became obvious that I could not organise a UK group like ASARUG. Over there it is informal — they keep in touch on air. That would not be possible with 200 members."

So the first issue of a regular newsletter was written. Called *SARUG News*, the 10 photo-offset sheets were produced and funded by Paul himself. The newsletter contained several programs, news and views from the US and information on the use of the ZX80 in amateur radio.

In the following months the membership settled down to an enthusiastic group of about 80. In November 1981, with the ZX81 widely available, Paul formed the present group — SARUG UK. He charged a £5 subscription fee to cover printing costs.

Issue 5 of the newsletter has now been sent out. SARUG UK currently has about 180 members in 14 countries.

Interface chip

With a one-chip interface I/O port and a small 350 byte machine-code program, a ZX81 can be connected to a radio. A simple algorithm allows the words to be keyed in and converted into Morse. Similarly, Morse can be decoded into English.

One problem with the use of the ZX81 is that its clock timer has a harmonic that is within the amateur bands. For this reason the ZX81 has to be shielded from the transceiver.

A microcomputer is, however, not only of use in sending or receiving radio signals. It can also be used to assist in circuit or antenna design, satellite tracking, logging of contacts and continuous receiver monitoring.

SARUG UK broadcast ZX programs in the 450 to 28 MHz band range. In the next few weeks a transatlantic ZX program exchange network will be set up with ASARUG.

One of SARUG UK's members is working on a real-time satellite telemetry and tracking system.

Paul's own interest is in the link between radio conditions and the weather. Little is known about the way radio waves travel through the air, but freak atmospheric conditions do result in reception anomalies.

Paul described an incident when he picked up a radio station in Norway while trying to contact Holland. Such effects are caused by atmospheric ducting. Layers of air of different densities can act as a tunnel, called a wave-guide, down which the radio signal is channelled.

He reckons that most conditions are predictable and would like to set up a continuous monitoring station to record radio conditions, weather and wind speed.

Membership of SARUG UK is open to all amateur radio licence holders or anyone with a proven interest in amateur radio.

For further information contact Paul Newman (G4INF), 3 Rise House Lane, Leiston, Suffolk.

We want to hear from you!

Whether you are starting a new club, holding a special meeting, or just changing the venue, we want to hear from you.

Write to David Kelly, Club News, *Popular Computing Weekly*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF or call him on 01-930 3271

Reviews
software

Banking system

J P Gibbons 14 Avalon Road Orpington Kent
ZX81 16K
Price £9.00

The ZX81 is now supported by a comprehensive catalogue of software. The vast majority of this software comprises games of one kind or another but as the ZX81 matures an area that is being increasingly developed is the business/personal finance program.

I first saw J P Gibbons Personal Banking System (PBS) at the 1981 ZX Microfair and thought it rather over priced at the time at £10. A year and several refinements later together with a drop in price makes it look a lot more attractive.

And this program is attractive. It comes with a detailed handbook and an amusing demonstration program on one side of the tape. This demonstration explains how the System works and also how Sinclair made his fortune.

The System takes a little time to set up and careful reading of the excellent manual is necessary whilst doing so. Once this is done the program runs well.

The account name together with the current year date and balance brought forward is typed in and then details of your standing orders. The standing order file will recognise between 10 and 24 monthly quarterly annual and semi annual payments. In the accompanying (slightly fictional) illustration I am paying Sir C £100.00 every six months. Popular Computing Weekly are receiving my £19.95 annual subscription on the 8th August. Standing order No 3 is a very generous payment of £250 every month from one F Fawcett. The rest is fairly explanatory and pure fantasy.

Now the data from your cheque-book can be added to the System. Cheque number date of cheque details (payee etc) and amount are all inputted and the PBS will then check through the standing orders posting any that are due on that date. The program then prints the information together with the up-dated balance for each input. Ten pages of 12 lines can be held in the PBS. As you can see from the next illustration the standing orders have been accounted for automatically.

Corrections of past data or additions to the file are easily made at any time. The program will however make certain that the user is sure of the correction before it proceeds with execution.

One more facility is offered by the Menu – Entry Search. Using this one can find a certain payment described by cheque number payee or amount and display the item. The program will find all occurrences of that description so that one can for example find out how much had been paid to the local supermarket over the year (if you are sure you wish to know!).

As with any program of this nature a printer is almost a necessity and all the pages of the account with either cheque numbers or payee details displayed can be printed. The standing order file and the Entry Searches can also be printed.

Back-up maintenance is provided for the PBS. This is unfortunately a rarity for the ZX81 and other manufacturers should follow Gibbons example in this. He will supply the purchaser with up-dates as they are implemented. Future developments will include a financial analysis routine and a 32K version giving a statistical break-down using histograms.

An interesting detail of the present program is a small machine-code routine for high-speed saving and loading of data, the whole process taking only some 45 seconds. The loading procedure over writes any data presently held by the PBS so multiple accounts can easily be handled without the need for lengthy re-loading of the master program.

Summary

The unique fast-load feature, the after sales support and the flexibility and user friendliness of this program make it a joy to use. Of greatest use in conjunction with a printer J P Gibbons Personal Banking System is a very successful program and can be recommended. TB

** STANDING ORDERS **

No	DETAILS	DUE DATE	AMOUNT
1	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	F. FAWCETT	[illegible]	[illegible]
4	MORTGAGE	[illegible]	[illegible]
5	INSURANCE	[illegible]	[illegible]
6	RATES	[illegible]	[illegible]
7	NEW CAR	[illegible]	[illegible]
8	SALARY	[illegible]	[illegible]

** BANK ACCOUNT (PG PAGE 1) **

DATE	DETAILS	AMOUNT	BALANCE
[illegible]	BAL BT FWD	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	SALARY	[illegible]	[illegible]
[illegible]	PC WEEKLY	[illegible]	[illegible]
[illegible]	F. FAWCETT	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	MORTGAGE	[illegible]	[illegible]
[illegible]	INSURANCE	[illegible]	[illegible]
[illegible]	RATES	[illegible]	[illegible]
[illegible]	NEW CAR	[illegible]	[illegible]
[illegible]	SALARY	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Charset-20

Rabbit Software 380 Station Road Harrow Middlesex
Vic-20 3K
Price £4.99

Vic owners must be relieved that some cassette software is at last coming on to the market at reasonable prices. We have had many calls complaining about the cost of some of the Commodore cartridges.

Charset 20 allows you to design your own characters for the Vic and is one of the more serious packages put out by Rabbit Software, a division of Cream Computers. At £4.99 the price is competitive even in comparison with Sinclair software.

The documentation for Charset-20 is non-existent. The enclosed small dot matrix printer strip of paper simply says Charset 20. As seems to be usual with Vic 20 programs the instructions are loaded first before the main program. At this point you learn that you need the 3K Ram pack to use the program.

There are seven screen-widths of instructions with the program. Reading through and trying to memorise the whole lot first time through is well-nigh impossible.

For the uninitiated and new Vic owners the instructions will mean very little. For example the opening words in the instructions are "When the program is run it will display several POKE'S which initialise various pointers in the Vic chip. Commands are also given to copy the character set which normally is at 32768 into Ram." Cast your mind back a few months and ask how much those instructions would have meant.

The technique used to design your own characters is quite simple. You select a character you will not need to use. Using the program the Vic will display the character as an 8 by 8 dot matrix. Each dot in the matrix can then be set using the BLK and WHT keys to set and clear the points. You use the cursor keys to move from point to point.

We gather from Rabbit that there have been some complaints from users about the lack of instructions and the need to point referring back to the instructions program. The company says that an instruction leaflet is now included with each cassette.

Summary

This is a relatively simple but useful program for the Vic 20. If you are interested in learning more about how your Vic works we would recommend it. The price of £4.99 is at the sort of level we would like to see of Vic programs. D

Reviews
hardware

TE I/o port

Thurnall Electronics 95 Liverpool Road Cadishead, Manchester
Price £17.95 assembled and £14.95 as a kit without case

This is not a memory-mapped port like many others as you cannot use PEEK and POKE to get information out of it. Instead Thurnall have provided a REM statement containing a machine-code routine which does the same job.

The port is based on a Z80A Programmable Input/Output device (PIO) addressed by having the address line A7 low (ie any number below 128 will give access to the port). The configuration of the port words is to be set before use.

It contains 16 lines which can form two 8-bit ports or one 16-bit port for input or output. In fact each bit of the 16 available lines can be individually assigned as either an input or an output. Once this is done the user can make use of two other connections from the port, the words and ready lines. These alert an external device that data is ready for it and waits for a reply before clearing the port for a new input or output. This is often called handshaking.

Being an input/output port the full amount of RAM can be used but care must be taken with addressing as the Sinclair's poor addressing here occurs on the input output map.

The instructions have been simplified and should be easy enough to use by a Basic programmer or a machine-code user. The port has dimensions of 4 × 3 × 5½ inches and plugs on to the edge of the ZX81 with an edge connector at the back for RAM, printer etc. There are many other boxes which can connect to the port containing relays, LEDs and joysticks made by the same company. The PIO is easy to use and the pins appear on a port edge on the right hand side so no soldering is necessary. SA

S-pack

DCP Microdevelopments 2 Station Close Lingwood Norwich
Price £49.95 extra ROMs £14.95

This unit connects to the back of a ZX81 to provide it with a computer generated speech facility. The black box contains a special processor and a ROM containing the words to be spoken. It also contains three other sockets so that other word ROMs can be plugged in. The unit does not obstruct any other extension of the ZX81 as there is a printed circuit board edge on the back of the box so that a RAM pack, printer etc. can still be plugged in. The S-Pack is driven from the ZX81's own



The 16-line input/output port now available from Thurnall Electronics.

power supply and requires no external amplifier since a volume control and loudspeaker are built-in. If however you want to connect it up to an external amplifier a 3.5mm jack-plug socket has been provided (it is the same size as the tape leads so the words can even be recorded on tape).

The S-Pack is memory-mapped into two locations in RAM (46149 and 46148) and is simply POKEd with the number of the word required. A pause of some sort must be included before the next word is spoken in order that the processor has time to put out the word. The word may be any one of the 72 included in the first ROM (which is provided with the S-Pack) or if all the available ROMs are fitted the total vocabulary is 248 words. Most of these words are measurements such as a complete set of numbers in the first ROM from zero to a million.

The first ROM also contains the whole alphabet. This includes Zee for Z as this is an American-produced ROM! One can however make some words out of the other words, by shortening the words spoken. This can be done as the processor stops talking as soon as another word is POKEd in. Only the beginning of the words can be used in this way though.

Summary

The DCP pack has a weird but definitely transatlantic voice at sufficient volume for the single user. It is very easy to use and there is much entertainment in trying to find how many other words you can make yourself. The price is well below anything yet available. SA

The Electronic office

By Dennis Jarrett
Gower/Philips 165 pages.
Price £12.50

To move into the age of the electronic office is costly — those intelligent copiers, teletext transceivers, satellite communications systems and so on do not come cheap. But come they will and indeed they are here.

This book also is not cheap but it is a readable well-illustrated account of the field written by a specialist journalist.

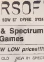
Many users of personal computers are becoming involved with computerised accounting, data-base systems, Prestel and even word-processing. These applications form the beginnings of a personal electronic office — an exciting concept requiring substantial investment and changes of attitude.

If your family is lukewarm about the time you spend poking around a keyboard you might consider it worthwhile to arm yourself with this book. It presents a fascinating new world.

Jarrett is right to insist that we must move fairly rapidly to the new world of automated office activity. Whether vested interests will allow us to do that is another matter. Certainly these influences will affect us all.

Summary

This is one of the best "person-in-the-street" accounts of progress, hopes and potential in the field of office automation. If that interests you then read it. KJ



Open Forum

Open Forum is for you to publish your programs and ideas.
It is important that your programs are bug-free before you send them in. We cannot test all of them.
Contributions should be sent to Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2H 7HF

How to contribute

Each week the editor goes through all the programs that you send to Open Forum in order to find the Program of the Week.

The author of that program will qualify for DOUBLE the usual fee we pay for published programs (The usual fee is £10.)

Presentation hints

Programs which are most likely to be considered for the Program of the Week will be computer printed and accompanied by a cassette.

The program will be well documented, the documentation being typed with a double spacing between each line.

The documentation should start with a general description of the program and then give some detail of how the program has been constructed and of its special features.

Listings taken from a ZX Printer should be cut into convenient lengths and carefully stuck down on to white paper avoiding any creasing.

Please enclose a stamped self-addressed envelope.

Character plot

on Vic-20

To design your own characters for the Vic-20, it is usually necessary to draw them on an 8 x 8 grid and then convert each line of the grid into a decimal value as in Figure 1.

The resulting values are then placed in data lines to be read by the program and poked into Ram memory locations to form the new character generator. This can be a tedious task, especially if there are many characters to be defined.

Program A allows you to design your characters on the screen, and on completion saves them on to tape ready for inclusion into any program.

Program notes

36-48 Checks where Basic program starts. Peek (44) = 18 with at least 8K memory expansion.

to next page

Character plot by John Ireland
Program A

from previous page

	Dependent on value found here, 5 and 20 are assigned stores to correspond to top left of grid
120-150	Draws grid
160-300	Movement of cursor around grid plotting or moving as required
300-410	Computes value of each point on grid and stores same in array A(K,J)
430-580	Saves characters to tape.

In Line 480 A is given the value corresponding to the current array A(K,J) value. Variable A is then saved.

This avoids the necessity of dimensioning an array in the program which is to use the new characters. On running the program a grid of + signs is displayed, each corresponding to a point on the character. Use the cursor control keys to move around the grid.

Type M to move without plotting. P to plot a point. F when character is finished. Should the display be ruined, for instance by hitting the stop key by mistake, typing R will redraw the grid and allow you to start over with the current character.

Program B can be inserted into your program to input the new characters from tape, poking them into memory locations determined by variable P.

Character plot
Program B

```
10 PRINT "START [illegible]
20 [illegible]IT SPFA
30 [illegible]
40 [illegible]
50 [illegible]
60 [illegible]
70 [illegible]
80 [illegible]
90 CLOSE1
```

Saturn

on BBC Micro

The following program draws a spectacular view of Saturn viewed approximately 200 000 miles away from its surface and roughly at latitude 30°.

At the start 150 stars of different colours are plotted while the planet begins to be drawn throughout the program. They are constantly changing colour but not position.

Accompanying the program as the drawing is taking place two sound channels are used. One increases in pitch while the other decreases at the same time giving a weird effect.

After the sixth and final ring has been drawn there is a short climax as the pitch steadily rises up to its highest value. Sound channel 0 is then used while a rapid flashing of the planet and its rings start progressively. With a humorous finale a French alien from Mars drops out of the top of the screen and plants a flag at the North Pole, pronouncing the planet his.

The program lasts for five minutes.

At the start the alien shape is defined together with the shape of the Flag.

Next comes star position determination where 150 stars are put in the array A(2,150), A(1,?) being x co-ordinate and A(2,?) being Y co-ordinate.

As the program progresses in the middle of the loop at line 110 two of the stars colours are changed — not more than this

PROGRAM OF THE WEEK

Saturn
by Peter Dann

```
10 [illegible]
20 VDU23[illegible]
30 [illegible]
40 VDU23 [illegible]
50 FOR A [illegible]
60 [illegible] NEXT A
70 [illegible]
80 [illegible]
90 IF [illegible] THEN 100
100 READ B C FOR A=B [illegible]
110 FOR [illegible] TO [illegible]
120 PROC[illegible]
130 SOUND [illegible]
140 [illegible] PROC[illegible]
150 [illegible]
160 IF POINT[illegible]
170 [illegible]
180 [illegible]
190 DATA[illegible]
200 FOR A=0 TO [illegible]
210 [illegible]
220 [illegible]
230 [illegible]
240 VDU [illegible]
250 [illegible]
260 GCOL[illegible]
270 [illegible]
```

otherwise the program will be slowed down too much. Overall this gives a twinkling effect throughout the program.

The point command is used in line 160 to make sure the rings go round the back of Saturn. At the heart of the program is the formula that draws the planet and its rings: X = angle x cos (length), Y = angle x sine (length) — line 150, not forgetting to change from degrees to radians.

There is only one procedure in the program — PROCsatum, which does all the drawing and sound effects.

In order to achieve the fast flashing at the end of the program two *FX commands are used: FX 9 and FX 10. Apart from the features mentioned the program is fairly simple.

That is all except that in the near future I hope many people will be able to sit back on an evening with their lights off in their dining room admiring their computer's spectacular graphics and a delightful view of our most interesting planet!

Atomic regression

on Atom

Regression is a program written in Atom Basic which will calculate and then plot the best fitting straight line through a given set of points. Although mainly of a mathematical nature the listing does showed a number of useful routines that the reader with a non mathematical idea might also find interesting.

Its applications are many fold. Imagine being able to impress your boss with predictions of next month's sales figures. You could tabulate the display average monthly lightings of the light-mantled Sooty Albatross at the local Ornithological Society or even the mean number of moves taken before being defeated by Rubiks Cube for the umpteenth time.

Regression requires an expanded Atom with the floating point Rom and a full 8K of screen memory. The listed length of slightly under 3K is intended mainly for clarity and can neatly be reduced to about 1.5K by abbreviating commands and using multi-statement lines.

Linear regression, as it is more correctly known, expresses the relationship between X and Y values in the form Y = a x + b. The problem is to determine the constant a, called the regression coefficient, and b, so that the straight line to be plotted can be considered as the best fit to the given set of values of X and Y.

The method is that of the least squares. This technique deals with minimising the errors that are bound to occur when attempting to obtain a best fit. The equations for the least square method can be expressed as

$$a = \frac{n\Sigma xy - \Sigma x\Sigma y}{n\Sigma x^2 - (\Sigma x)^2}$$

$$b = \frac{\Sigma y - a\Sigma x}{n}$$

Σ denotes "sum of". Thus Σx reads "the sum of all the x values". n is the number of points. This will produce the equation for the line of Y regressing on X.

Those wishing further information on linear regression should be able to obtain it from any reasonable statistics book.

On running, the screen will clear and request you to input the number of points to be plotted. These should then be entered as X and Y values in response to the Atom's prompts. Lines 210 and 250 call subroutine k — lines 1000 to 1090 — if the number of points exceeds four. This routine, which links to FE0A hex in the Basic Interpreter Rom, is included to present a more acceptable screen format and can keep up to seven of the top screen lines static whilst scrolling the rest of the screen up a single line.

The number of unscrolled lines is determined by the contents of the Y index register. As the low order bytes of Basic's A, X and Y variables are transferred to their respective 6502 registers when the LINK command is executed, it is a simple matter to add this value. The formula is simply

$$Y = (n*32) + 32$$

n is the number of lines — 0 to 7 — to be left unscrolled.

Atomic regression
by Bruce Smith

to next page

Bridge deal

on Pet

Bridge players can never have too much practice in bidding on diverse hands but it does get rather tiresome continually dealing out the cards for this purpose. I've never been madly keen on Pet graphics, but one thing they can do well is produce the symbols for the suits of cards.

Four columns of thirteen cards each are printed on the screen having been dealt at random by the use of the RND function. The ace is quite properly numbered 1. The picture cards are also left as numbers 11 (Jack), 12 (Queen) and 13 (King) since they represent the points value of each of these cards and can thus be a useful reminder when totalling the value of the hand.

The hands of each partner are printed adjacently so that it is easier to see how well they could support each other in play

Bridge deal
by Gordon Millington



Instant screen

on ZX81

I had a program which needed to use a mixture of print and scroll statements, giving a sets of results then a series of scrolled newsflashes and then an updated used of results.

This was all very slick except that it took about 30 seconds to clear the screen after the scroll and so spoiled the effect.

My son was writing a space chase game and wanted a black screen. This was also spoilt by the delay while the screen was printed.

Here is a routine which will solve the problem. First type in

```
1 REM ECRND(graphic 1) CHR$(graphic 3)??RETURN?C(graphic 7)?(graphic space)?"?(inverse LOOK)LET
```

Return and Let are both entered by using THEN, moving the cursor back and erasing the THEN.

There are no spaces needed between characters. There are four instructions we cannot enter from the keyboard. These are represented by ? in the listing. We must enter these one at a time using the following instructions.

```
POKE 16523 130
POKE 16522 118
POKE 16530 118
POKE 16530 130
```

To call the routine type RAND USR 16514. You will then get a black screen. To clear the screen type POKE 16527 0.

To check that it works write a short program to print something to the screen. Try for example

```
10 FOR I = 1 TO 21
20 PRINT "32 of any character"
30 NEXT I
40 RAND USR 16514
```

You can fill the screen with any letter, number or graphic character you wish simply by using the command, either directly or as part of the program, POKE 16527 X, where X is the number representing the character you want, as given in the back of the Sinclair ZX81 manual.

To use this routine add the line LET XX = USR 16514. You could use RAND USR 16514 but if you are using RND in your listing the same sequence of numbers will always occur.

A catch is that you must reset the print position after each time the routine is used. Do this by making the next PRINT command PRINT AT 0,0 or any desired position, or else you may get an error 5 — screen full — code even though the screen is empty.

This routine can also be used to fill or reset any number of lines on the screen. Table 1 gives the numbers you will need to POKE 16518 and POKE 16519, either as a direct command or as part of a program.

turn to next page

Instant screen
by Roger Elder

TABLE 1

LINES TO PRINT/CLEAR	1	2	3	4	5	6	7	8
POKE 16518	20	85	28	131	164	187	250	6
POKE 16519	0	0	0	0	0	0	0	[illegible]
LINES TO PRINT/CLEAR	9	10	11	12	13	14	15	
POKE 16518	41	74	107	140	173	206	239	
POKE 16519	1	1	1	1	1	1		
LINES TO PRINT/CLEAR	16	17	18	19	20	21		
POKE 16518	16	49	88	115	48	181		
POKE 16519	2	2	2	2	2	2		
LINES TO PRINT/CLEAR	22	23	24					
POKE 16518	214	247	28					
POKE 16519	2	2	3					

TABLE 2

DECIMAL ADDRESS	HEXCODE	OPCODE	M/C BYTES	BASIC EQUIVALENT	BASIC BYTES
16514/5/6	2A 0C 40	LD HL (D FILE)	3	LET X=PEEK 16396+256*PEEK 16397	36
16517/8/9	01 D6 02	LD BC 02D6	3	LET Y=726	7
16520	23	INC HL	1	LET X=X+1	[illegible]
16521	7E	LD A, (HL)	1	LET Z=PEEK X	10
16522/3	FE 76	CP 76	2	IF Z=118	
16524/5	28 28	JR Z + 3 (lines)	2	THEN GOTO	15
16526/7	3E 80	LD A, 80	2	LET Z=128	[illegible]
16528	77	LD (HL),A	1	POKE X,Z	7
16529	0B	DEC BC	1	LET Y=Y-1	[illegible]
16530	78	LD A,B	1	LET Y=Y-1	
16531	B1	OR C	1	LET Y=Y-Y	
16532	C8	RET Z	1	IF Y=0 THEN RETURN	[illegible]
16533/4	18 F1	JR -15 (lines)	2	GOTO	8

TOTAL M/C BYTES=27 (INC LINE No. 000 REM)

TOTAL BASIC BYTES=128 (INC LINE Nos)

Solitaire
by Colin McCormick

```
[illegible]
```

from previous page

It also gives the number of lines from the top which will be cleared or filled.

Table 2 gives the complete routine. The first number is the decimal address followed by the hex code, the op code, the number of bytes for each instruction and finally the equivalent Basic commands and the bytes that they would use.

Solitaire

on Vic 20

There seem to be so many programs for shooting down little aliens. So for a change here is a program that suits an old game but with colour and sound and no cheating.

The game is written for the Vic 20 but as the positions are plotted using print statements — lines 1010 to 1050 — it should be converted to other machines.

An array is used for setting up which pegs are and are not present. A 1 is a peg, a 2 is no peg. The data is used to give the co-ordinates of each peg. The zeros indicate that a position need not exist. The pegs are arranged as shown and are displayed this way on the screen.

		3	4	5		
		10	11	12		
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
		38	39	40		
		45	46	47		

Each position has a mathematical relationship with its neighbours. This allows the calculation for checking the validity of moves to be quite simple — lines 770 to 800 and 7000 to 7003.

When the game is run it will ask you if you want diagonal moves. If you reply Y then it will go to line 7000 to check for diagonal moves when the game is played. R is the position being moved from, S is the position being moved to and L is the peg being taken.

Subroutine 4035 erases the top line for the next instruction or message. A peg is shown on the screen in red and is shown removed in light yellow. Lines 2040 to 2080 see if only one peg remains and if so the game stops. If this last peg is the centre one 25 then a message of congratulations is shown.

Snaky letters

on BBC Micro

This program contains adequate instructions. I advise you however to start with the lowest speed.

If you prefer to use different keys to

next page

```
[illegible]
1000 PRINT"[illegible]"
[illegible]
4030 PRINT"[illegible]"
4040 RETURN
[illegible]
8040 PRINT "[illegible] YOU WANT ANOTHER GAME? (Y/N)"
[illegible]
```

Snaky letters
by Alan Wood

```
[illegible]
300CLS
[illegible]PRINT"SNAKY LETTERS"
[illegible]PRINT"------ -------"
310PRINT "The object of the game is to hit as manyletters as possible with your snake"
[illegible]PRINT"If you hit part of your tail or the sideof the arena you die "
[illegible]PRINT"Use the following keys :-"
[illegible]
[illegible]PRINT "Your tail will randomly decay leaving holes for you to get through"
370REPEAT INPUT"Enter speed (1-fast , 9-slow) [illegible]
[illegible] ANY KEY TO CONTINUE
[illegible]
410CLS PRINT "You scored "; [illegible]
[illegible]
[illegible] PRINT "A NEW RECORD" [illegible] ELSE PRINT "The record is " [illegible]
[illegible]
[illegible]
```

from previous page

control movement just change the letters in lines 150-180.

The scoring in this game is complex, but basically A scores 1 and Z 26. Other letters score according to their position in the alphabet when you hit them. This score is displayed at the bottom of the screen. At the end of the game this score is scaled according to the speed to give an actual score.

Currency

on ZX81

Currency is for any ZX81 Basic 1K unit. It will convert currency A to currency B and vice versa.

When the program is first run it requires a conversion line which needs the amount of currency A per unit currency B. The program assumes that the answer is wanted to two decimal places. The signs used to denote each currency must be only one character placed before the number.

If the currencies used are pounds and Deutsche Marks we could use £ and D. Supposing we know 4.2DM = £1 then enter the conversion line D4.2£.

Currency
by Nick Causton

```
CURRENC        CAUSTON

  10 PRINT "   TER  (SIGN CURRENC
Y A) (AMOUNT  URRENCY A PER UNIT
CURRENCY   (SIGN CURRENCY B)
  20 INPUT A$
  30 LET   VAL A$(2 TO LEN A$-1)
  40 CLS
  50 PRINT A   1 0 A$  TO LEN A$-
1), TO THE    A$(LEN A$)
  60 SCROLL
  70 PRINT AT 7,0,"ENTER SIGN,AM
OUNT FOR CONVERSION
  80 INPUT U$
  90 PRINT AT   0
                      AT 7 0 U$.
=
 100 IF W$(1)=A$(LEN A$) THEN PR
INT A$(1),INT (VAL W$(2 TO )*M+1
00)/100
 110 IF W$(1)=A$(1) THEN PRINT C
$(LEN A$),INT (VAL W$(2 TO ) /M*
00)/100
 120 SCROLL
 130 SCROLL
 140 GOTO  0
```

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Programs for each category should be accompanied by a cassette, a copy of the listing and full documentation. Points will be awarded for use of machine code, innovation, structure and ease of use.

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A competition coupon will be published in each issue of *Popular Computing Weekly* for the next five weeks. To enter the competition you must send in your program together with any four differently numbered coupons to:

Popular Computing Weekly
Programming Award Scheme,
Hobhouse Court,
19 Whitcomb Street,
London WC2.

Rules

1. *There is no limit on the number of entries you can send in, but each entry must be accompanied by four differently numbered competition coupons.*
2. *Closing date for entries is August 15, 1982.*
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4. *The Judges' decision is final.*
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A numbering program you can count on

David Lawrence presents a basic re-numbering routine for the ZX81

For those of you who have not lashed out and bought a machine code re-number facility, this basic routine will be of considerable interest. Though by no means as fast as a machine code re-number program — this routine takes around 30 seconds to re-number an average 1K program — this ZX81 basic re-numbering routine does the job. It requires just over 1K and includes the re-numbering of GOTOs and GOSUBs.

The routine is intended to be loaded at the beginning of a program. It should be saved as part of the program during its development, though you may wish to delete it when the program is finalised.

The routine re-numbers all lines before 9959 starting at 1000 with a gap of 10 between the lines. If you wish to have another base or another gap alter the variable base in line 9976 or the increment in line 9987. Once familiar with the working of the routine you may also wish to shorten it by reducing the variable names to single letters. This saves over 100 bytes.

To use the routine, use GOTO 9959.

9959 T$ is the string used to store the location of the various GOTOs and GOSUBs in the program.
9962 Line is simply the line number of the line currently being examined.
9964 Length is the value of the two bytes which store the number of characters in each line.
9972 An error warning will occur when the GOTO or GOSUB destination does not have 4 digits, eg GOTO 20 should be altered to GOTO 0020. If this error message occurs, alter the relevant command and re-run.
9974 The relevant of the GOTO/GOSUB is recorded in T$ along with the destination.
9983 Having recorded in T$ all the GOTO/GOSUBs, this loop examines T$ on the number base through the program to see if the line about to be re-numbered has a GOTO/GOSUB referring to it.
9986 The line is re-numbered.
9987 The next line number is created.
9988 The next existing line number is picked up.
9990 GOTO/GOSUB destinations are recorded twice in a program line, [illegible] simply as characters, and once in floating point notation. This loop pokes the characters of the new line number then the bytes holding the pokes.
9993 These lines transform any integer number in the range 1-9999? into the five bytes of the ZX81 floating point number.
9985 This line jumps past REM statements. If you wish to use a non-standard GOTO/GOSUB like GOTO X, simply insert a REM at the beginning of the line and you will not run into the error message at line 9972.

```
9959 LET T$=""
9960 LET X1=16509
9961 LET X2=X1+2
9962 LET LINE=256*PEEK X1+PEEK (
X1+1)
9963 IF LINE>=9959 THEN GOTO 997
6
9964 LET LENGTH=PEEK X2+256*PEEK
 (X2+1)
9965 IF PEEK (X2+2)=234 THEN GOT
O 9969
9966 FOR I=X2+2 TO X2+LENGTH
9967 IF PEEK I=236 OR PEEK I=237
 THEN GOSUB 9971
9968 NEXT I
9969 LET X1=X2+LENGTH+2
9970 GOTO 9961
9971 IF PEEK (I+5)=126 THEN GOTO
 9974
9972 PRINT "NON-STANDARD COMMAND
, LINE ",LINE
9973 STOP
9974 LET T$=T$+STR$ I+CHR$ PEEK
(I+1)+CHR$ PEEK (I+2)+CHR$ PEEK
(I+3)+CHR$ PEEK (I+4)
9975 RETURN
9976 LET BASE=1000
9977 LET X1=16509
9978 LET X2=X1+2
9979 LET LINE=256*PEEK X1+PEEK (
X1+1)
9980 IF LINE>=9959 THEN STOP
9981 LET LENGTH=PEEK X2+256*PEEK
 (X2+1)
9982 FOR I=1 TO LEN T$ STEP 9
9983 IF VAL T$(I+5 TO I+8)=LINE
THEN GOSUB 9990
9984 NEXT I
9985 POKE X1,INT (BASE/256)
9986 POKE (X1+1),BASE-256*INT (B
ASE/256)
9987 LET BASE=BASE+10
9988 LET X1=X2+LENGTH+2
9989 GOTO 9978
9990 FOR J=1 TO 4
9991 POKE (VAL T$(I TO I+4)+J) C
ODE (STR$ BASE)(J)
9992 NEXT J
9993 LET BYTE1=128+INT (LN BASE/
LN 2+1)
9994 LET BYTE2=BASE*65536/(2**(B
YTE1-128))
9995 LET MEMORY=VAL T$(I TO I+4)
9996 POKE MEMORY+6,BYTE1
9997 POKE MEMORY+7,INT (BYTE2/25
6)-128
9998 POKE MEMORY+8,BYTE2-256*INT
 (BYTE2/256)
9999 RETURN
```

Spectrum

In this new slot various contributors explore different aspects of the ZX Spectrum.

The rainbow route to rotating arcs

Nick Hampshire with more programs demonstrating PLOT and DRAW

In this series I have already gone into some detail about how the Draw and Plot commands can be used on the Spectrum. They are quite adequate for most applications although the users of more sophisticated computers may well find them somewhat cumbersome.

With a bit of thought however we can create some very interesting effects.

Last week I introduced the Circle command as the basis for drawing a piechart. In the first program the command was used in a program loop and the radius from the centre of the disc was varied on each step. The distance between each of the set of concentric circles could be altered but we discovered that that was about all we could do with the Circle command.

The drawbacks we found with the Circle Command were that (a) the spacing between the dots in each concentric circle could not be varied, and (b) it was impossible to draw a segment of a disc.

In Figure 1 you will find another program for drawing a circle, developed from the one I presented last week. XO and YO are the co-ordinates for the centre, RA is the radius and DP is the angle between the points. It is only a short step from using the circle program in Figure 1 to drawing arcs.

There is a listing for just such a program in Figure 2. P1 is the start angle and P2 is the end angle.

In Figure 3 I have taken the program one stage further. The program draws a series of arcs within a loop, forming a number of concentric arcs with the spacing between the arcs changing every fourth run in the loop.

To add to the effect the colour of the points are changed on each step. The result is an image of a rainbow. The colour codes are held in the data statement in line 400, read in line 80 and acted on in line 85.

The next stage is to add some movement to the graphic figures we have created. Figure 4 is a program with which to rotate the picture. All the program does is rotate a point about the centre of the circle at co-ordinates X, Y in a radius XR. To do this I have used a matrix transform technique.

The matrix is stored in array c and is loaded in lines 1200—1240. The rotation is performed by lines 1000—1020. The plotting is controlled in lines 100—210. R1 is the incremented angle and XR is the radius.

Finally for this week is the program in Figure 5. It is the same as Figure 4 except that it rotates a line instead of a point. XR is the inside radius of the line starting relative to the centre. XE is the outside radius of the line, relative to the centre and R1 is the incremented angle.

Next week I will develop some more sophisticated rotating graphic programs and if there is space start introducing some ideas about three-dimensional graphics.

In the meantime I hope that some of you will soon have your Spectrums delivered. When you do let me know if you can find simpler ways of creating any of the same effects.

```
[illegible]
```

Fig. 1

```
[illegible]
```

Fig. 2

```
[illegible]
```

Fig. 3

```
[illegible]
```

Fig. 4

```
[illegible]
```

Fig. 5

Sound & vision



Going traditional with Pet sounds

Greensleeves and The Yellow Rose of Texas are both programs which play songs on the Commodore Vic20. The heart of the Greensleeves program lies in line 20 which pokes all the data into the Vic20. The data statements which tell the Vic20 which note to play are contained in lines 30-100.

Similarly, the core of The Yellow Rose of Texas program lies in lines 10-80. These lines poke the data statements from the program into the Vic20.

Both programs were printed on my school's Pet printer. Vic programs on cassette will not normally read onto the Pet, but this problem can be overcome with a machine code routine. The following routine should be useful for anyone who wants to obtain a listing of a Vic program from a Pet printer:

1 SYS 1024
2 M0400 0407
3 0400 00 01 10 00 8F 00 00
4 Press RETURN
5 Press X and RETURN

If your Pet cannot use machine code, enter the following line:

POKE 4096,1:POKE 41,16:RUN

Nagaraj Jayakumar

```
GREENSLEEVES

1 REM ***************
2 REM *             *
3 REM * GREENSLEEVES *
4 REM *             *
5 REM *     BY      *
6 REM *             *
7 REM * N M JAYAKUMAR*
8 REM *             *
9 REM *   9/5/82    *
10 REM ***************
20 POKE36878,15 A [illegible]
   READC POKE [illegible]
30 DATA209,200,217,400,221,200,225,300,209,100
   225,200,221,400,215,200,203,300,209,100
40 DATA215,300,217,400,209,400,209,100,207,100
   209,200,215,400,207,200,195,400,203,200
50 DATA217,400,221,200,225,100,228,100,225,[illegible]
   221,400,215,200,203,300,209,100,215,200
60 DATA217,300,215,100,209,200,207,300,203,100,
   207,200,209,600,209,400,229,600,229,[illegible]
70 DATA228,100,225,100,221,400,215,200,203,[illegible]
   209,300,215,[illegible],209,[illegible],209,300
80 DATA207,100,[illegible],200,[illegible],200,195,600
   [illegible],225,300,[illegible],400
90 DATA215,200,203,300,209,100,215,200,217,300
   215,100,209,200,207,300,201,100,207,[illegible]
100 DATA209,600,209,400
```

Contribute!

You can share your own favourite Sound or Vision programs with other readers by sending lists with explanations to us at *Popular Computing Weekly*

WRITE TO: Sound & Vision, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

Peek & poke

Peek your problems to our address. Ian Beardsmore will poke back an answer

WATCH THIS SPACE BEFORE CHOOSING

[illegible] Sheffield Close, Little Sutton, Cheshire writes:

Q Could you tell me which computer if any is best suited for my needs. Besides the usual features I should be able to file an index for my record collection which includes 1,000 Singles, 500 LPs and 900 78s. Cross-references should include artists, titles, first lines of songs and musical groupings such as Classical, Rock and Charts. And if that is not enough I would like a strong Chess player as well.

A The most essential thing that you need is storage space and in effect that means a disc unit. The one essential piece of information that you leave out is price. The cheapest solution would be a ZX81 and a Monolith disc drive but that would leave you little change out of £300. A BBC Micro or a Vic 20 with disc drive would both be up in the £600 range.

You also fail to say how soon you need your computer. This year is going to see a great deal of activity in the micro market with both Acorn and Commodore promising to bring out cheaper computers to compete with the ZX Spectrum.

More importantly the new ZX Microdrive is on the horizon. It is already causing a great deal of interest as it looks set to cut the price of disc storage by at least half if not more. But it will be some months yet before the Microdrive comes onto the market. It is safe to assume that once it does come out interfaces will quickly be developed to allow it to be used on other computers in much the same way as the ZX Printer can now be used with a Vic 20 or a BBC Micro.

My advice is to wait until the autumn, by which time you should find your way greatly enhanced. Concentrate on the main computers — the ZX Spectrum, the proposed Acorn Electron and the new Vic 10 and Vic 30 — as they are the best supported. Also keep an eye on the developments of the Sinclair Microdrive disc unit. As for the Chess, there are quite a few programs to choose from and I am sure finding one to suit will not be much of a problem.

FLASHER STRIKES IN BORDER INCIDENT

[illegible] writes:

Q I have a BBC microcomputer model B. Please could you tell me if the BBC Micro has an equivalent command to the BORDER command on the ZX Spectrum and the Vic 20?

I would also like to know how to alter the flash rates of the colours. Is it possible to alter the combinations of colour to get flashing red/black instead of the red/cyan?

A The answer to your first question is no. The BBC Micro uses the 6845 chip which has an uncommitted logic array when it comes to defining a BORDER. Unlike for example the Vic chip, the 6845 simply does not have a BORDER function in its architecture.

Changing the flash rates and the colours is done by changing the numbers before or after the comma. These numbers control the colour on the screen and its duration.

*FX 9,10

Change the number before the comma to change the colour and change the number after the comma to change the duration.

GAME, SET AND MATCH—AT ONCE!

[illegible] Watford [illegible] writes:

Q I am writing [illegible] games [illegible] BBC Micro input [illegible] necessary [illegible] keyboard scan. So far I have been using the INKEY function. This works once when the key is pressed, but there is a delay before it works again as the key is being held down. How can I get a smooth action without this delay?

A Before reading the keyboard input the following two

*FX 12 1
*FX 11 1

This will cause the key to repeat as soon as it is pressed. Follow it with this line, which clears the buffer after the appropriate INKEY or GET statement

*FX 15 1

WHEN A COMPUTER IS NOT A COMPUTER

C R James of The [illegible], Henley-on-Thames writes:

Q I am the owner of a Philips G7000 and am greatly frustrated by the limits of the computer's programmability. Please could you give me some software. Vic, Atom and Atari have a wide range of software but the G7000 has none.

Is there anyway to expand the G7000? I am tempted to buy a computer from Digital as the storage is greater than the G7000 which only has about 1K.

A This caused me some problems when I first read it. A Philips G7000? It was a new game to me.

The problem was sorted out after telephone conversations with Philips Computer and Video Games and Carl Bayer all of whom were very helpful. It turns out that the Philips G7000 is not a computer, it is a computerised video TV games machine.

While you can use a computer to play games on your television you cannot use a games machine as a computer. Apart from a very simple 'Teach yourself Basic' cartridge which has nothing like the range or capacity of a real computer, there is no way you can use the G7000 as a home based micro.

If you want to get a micro then I would suggest that you look at something like the Vic, an Acorn or a ZX, all of which are well supported. You might find it worthwhile to wait a few months as new releases are due from both Acorn and Vic which should widen your choice.

If you decide not to sell your Philips to buy a better machine then there is a club for Philips owners. The address is G7000 Video Game Club, 345a Station Road, Harrow, Middlesex.

There is one more point to make. Did you buy your G7000 because you thought it was a computer, or because you went into a shop, asked for a computer and was sold a G7000. In the first case I am afraid that it is just bad luck. In the second case, I suggest that you return the machine and try and get your money back.

APOLOGY

Several people have written and pointed out that the answer I gave to Simon Cray in Issue 5 was wrong. You can EDIT even if your memory is nearly full.

The first method is to LIST the line that has to be EDITed and then press SHIFT/EDIT. I already knew about this method but made the mistake of assuming that Simon had already tried it. However this method does not always work, especially when the memory is very close to being completely full.

One method that will work, even when the previous one fails, is the following:

1. Move the cursor to the line you want to EDIT
2. Enter CLS followed by NEW LINE
3. Press SHIFT/EDIT simultaneously

This frees the computer from having to maintain a screen display. The line you want to EDIT will be ready and waiting at the bottom.

Send your questions to Peek & poke, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

Competitions

Puzzle No 11

Puzzle No 11

A bee hive stands at the end of a straight one-mile-long wall on a country estate. Growing along the foot of the wall are some clover plants. The first plant is one foot from the hive entrance. The distance between the first plant and the second is three feet, between the second and third is five feet, and so on. In other words, the distance between each successive plant increases by two feet each time.

A bee starts from the hive, flies to the first plant, collects the pollen and returns to the hive. It then flies to the second plant, collects the pollen and returns to the hive. It repeats this procedure to all the flowers until it returns exhausted, from the plant at the end of the wall farthest from the hive. What is the total distance that the bee has flown doing its work?

Solution to Puzzle No 7

For the nine discs there are 9×8×7×6 = 3024 possible combinations. Each set of four digits can be arranged into any one of 24 different combinations, so the number of different draws possible is 3024/24 = 126.

We now need to know how many of these combinations cannot be arranged such that at least one of each of the 24 possible arrangements is a multiple of seven.

By running the program, it can be shown that there are only three possible odds 1258, 1358 and 3469.

```
10 LET Y=0
20 FOR A=1 TO 6
30 FOR B=(A+1) TO 7
40 FOR C=(B+1) TO 8
50 FOR D=(C+1) TO 9
60 LET N$=STR$ D 1000 C 100 B 10 A
70 FOR E=1 TO 4
80 FOR F=1 TO 4
90 IF E=F THEN GOTO 180
100 FOR G=1 TO 4
110 IF G=E OR G=F THEN GOTO 150
120 LET H=10-(E+F+G)
130 LET N=VAL N$(E)*1000+VAL N$
    (F)*100+VAL N$(G)*10+VAL N$(H)
140 IF N/7=INT (N/7) THEN GOTO 190
150 NEXT G
160 NEXT F
170 NEXT E
180 LET Y=Y+1
190 PRINT N
200 NEXT D
210 NEXT C
220 NEXT B
230 NEXT A
240 PRINT AT 10,0;"NUMBERS OF SUCCESSFUL
    DRAWS";Y
```

Of the 126 different draws possible only three will produce winning numbers. So, to win a pound for a 10p stake the odds are rather unfavourable — 41 to 1 against!

Winner of Puzzle No 7

The winner is David Ware, Carnaby Close, Holme, Manchester, who gets £10.

Solution to Crossword No 7

Across. 6 Notice 5 Process 10 Soft 11 Compiler 13 Paging 14 Nitric 17 Exchange 18 Call 21 Execute 22 Wreck

Down. 1 Interpreter 2 Adding 3 Ash 4 EPROM 5 Soup tin 6 Cell 7 Ostrich-like 12 Sneak up 15 Reader 16 Agree 16 Crew 19 Awl

Winner of Crossword No 7

The winner is Clare Penny, Lelant, Cornwall, who receives £10.

Crossword No 11

Across

[illegible]

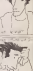
Down

1 Light bodies show less whispering ... (5)
2 ... (7)
3 ... (1, 1, 2)
4 Peculiarly in Hindu style (5)
5 Crept, less a hundred years (4)
6 ... (4, 1½)
7 ... (4)
8 ... (7)
9 They get about or make speculation (5)
10 Peek as ... again (4)
11 Lean ... (4)
... Specially and grossly terminable (3)

CITIZEN PAIN

BY DAVID IRELAND and JAMES MACDONALD





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